Information Systems Development Support (ISDS) Contract
Contract Work Order (CWO) Implemention Plan

for

CWO 5 - Design Engineering & Logistics Support for GCF Transmission Engineering

Developed by
The ISDS Team
320 North Halstead, Suite 160
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Under

Contract No. 960100
Control Number: WIP_05-1.DOC Rev 1
DRD # MA005
5 July 95

for the

California Institute of Technology
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena CA 91109-8099

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Foreword

Due to the timing of these Work Implementation Plans (WIPs) relative to (i.e., subsequent to) the start of the current DSN development efforts, a slightly different approach is being used than would normally be the case. WIPs document the planning that normally precedes development. The document then grows and is modified, if necessary, to reflect a dynamic development environment. Since much of the detail exists for tasks already in progress at the beginning of the ISDS contract, the WIP references existing detail without significant elaboration.

The WIP is envisioned as a central repository to pull together, by reference or inclusion, all the information available for a particular development task. The objective is to provide all the information necessary to plan, monitor and control the progress of each task. This is done with an eye on improving the total product and reducing redundancy thus, paper.

Future WIPS will incorporate CASE and other development tools, when authorized, to reduce documentation costs and provide for the integration of the design and documentation processes into a single homogeneous (seamless) process. That is, documentation will be produced as a natural result of the planning, design and implementation process rather than as a separate activity.

Preface

This is the top-level document used for defining and controlling the effort, organizational structure, management authority and responsibility, and resource allocations.. This is the baseline for continued enhancement and maintenance of the technical and management standards developed under the guidelines set forth in DRD MA005 and the ISDS Program Management Plan. It utilizes the ISDS development methodology.

The **order of precedence** of documentation is the ISDS contract and attachments, then the ISDS Project Management Plan and its supporting procedures, and then this plan. The ISDS Project Management Plan and supporting procedures can be explicitly waived with the concurrence of JPL and ISDS Team management. Such actions and decisions are documented in Section 11, Deviations, Exceptions, and Waivers.

Table of Contents

1. Introduction

This is a support task, beginning with many activities already in progress, providing assistance to JPL with requirements definition, functional design, implementation, test, documentation and training for DSN communication system upgrade.

1.1 Background

DSN is geographically distributed, complex, reliable, communication network. The GCF Data Communications System (GDC) provides formatting, recording, processing, monitoring, and delivery of data block information to interfaces both within and outside DSN. The GCF Upgrade Task will provide a world-wide communication network connecting JPL with the Deep Space Communication Complexes (DSCCs) and Remote Mission Operations Centers.

1.2 Purpose

The purpose of CWO 05 is to provide design engineering and logistics support to the GCF Transmission Engineering Group.

2. SOW & Deliverables

2.1 SOW

This CWO provides Design Engineering and Logistics Support to the GCF Transmission Engineering group tasks.

Many of the tasks outlined in the deliverables section have been initiated and are presently in some phase of development and implementation.

The two new tasks that are anticipated during FY '95 are:

1) to define and implement additional baseband channels between DSSs 16/17 and SPC 10 and
2) design and implement a precision clock source for selected circuits within the Central Communications Terminal.

2.2 Deliverables

2.2.1 CWO Specific Deliverables

	Task Description	Completion Date
1	Complete documentation and transfer of voice compression equipment in CCT and at DSCCs 40 and 40.	11-15-94
2	Complete the documentation and transfer of the CCT to TOPEX POCC COMM link.	12-15-94
3	Complete the documentation and transfer of CCT to CTA 21 Comm link.	1-15-95
4	Complete the interconnect diagram and all assembly drawings for the new digital matrix switch in CCT	2-1-95
5	Document and transfer the new NIMs and Vmail in their final configuration.	4-1-95
	(New Tasks)	
6	Add baseband channel equipment to the SPC 10 to DSSs 16/17 fiber link. Equipment needs to be integrated into existing configuration where possible. Upgrade documentation, prepare complete mod kit including cables and transfer.	5-1-95
7	Prepare and provide complete mod kit to implement a highly reliable, precision clock source in the CCT. Equipment spares and cabling are to be specified and procured.	9-15-95

2.2.2 Deliverables Required by Contract or Derived from the CWO

See contract No. 960100 for specific data requirements of the CDRLs identified below.

1. MA005 - CWO Implementation Plan - draft, final, and updates as required
2. MA006 - Monthly Progress Report
3. MA007 - CWO Weekly Status and Major Problems Report

3. CWO Development / Implementation Approach

3.1 CI Development

No special development approach is utilized for this CWO.

3.2 Documentation

Documentation tasks consist of redlining existing JPL documentation and supplying the redlines to JPL CAD or technical publication sections for incorporation.

4. Management Approach

The management approach for this CWO is derived from and is consistent with the ISDS Program Management Plan. CWO specific items are limited to the WBS and the details of the CWO.

4.1 Subcontractors

4.1.1 Computer Sciences Corp. (CSC)

Infotec has retained CSC as its subcontractor for the ISDS contract. The terms and conditions of this subcontract are contained in Infotec's subcontractor agreement SK9503.

The ISDS Team which consists of Infotec and CSC operates as a virtual corporation with all direction and decisions residing with the Infotec PM. Technical direction of each CWO resides with the CWO manager regardless of company affiliation. CWO staffing is based on the best personnel able to meet the needs of the CWO without regard for company. JPL's interfaces with a single point of contact, the ISDS Team.

4.1.2 Affiliates/Consultants

There are none.

4.2 CWO Change Management

Change management for this CWO follows the process defined in the ISDS Contract where CWO Supplements are defined.

Specifics regarding each supplement are covered in associated Pricing and Negotiations Memorandums. These memorandums are proprietary in nature and are available to JPL upon request.

4.3 Tracking the Work

Schedules are given to all personnel working on the CWO. The schedule contains the individual's tasks and expected completion/milestone dates. In addition, all CWO personnel are given a Work Authorization Document (WAD) which contains valid time charge numbers correlated to the CWO tasks.

Weekly status reports are submitted by the CWO personnel to their CWO manager. These reports are used to update the CWO schedule contained in Microsoft Project and track CWO progress. CWO costs are collected and tracked in Microframe using CWO personnel timecard data and MIS data downloaded from corporate computers.

5. Risk Management Plan

Risks specific to this CWO are presented in the following two tables. The first, Table 5-1, enumerates the high level risks associated with this CWO and with most CWOs.. The second, Table 5-2, enumerates critical risks, impact, and the technical and managerial mitigation strategies for this CWO.

Table 5-1 - High Level Risks for the CWO and How the ISDS Team Significantly Mitigates their impact on JPL

Type	Factor	CWO	Mitigation
known	Assumptions	Skill mix Technical Assumptions	Scope of CWO Scope of CWO
potential	Commitments	GFE availability and quality	Identify it all, plan for it
	Technical / Management	Estimates & assumptions Interpretation of requirements Availability of key personnel	Interface with JPL to identify ahead of time Interface with JPL to identify ahead of time Skills are generally available in the job market
	Knowledge loss at CWO end	Inability to respond to problems or change requests	All work is documented and checked.
Unknown	--	Changing funding & priorities Changing requirements Key personnel attrition	All work is documented and checked. All work is documented and checked and necessary skills are generally available in the local job market

Table 5-2 CWO Requirements Risks, Impact, and Mitigation Strategies

Risk	Impact if Risk Realized	Mitigation
GFE/GFI not available in a timely manner	Activities delayed and impacted.	Identify GFE/GFI early to JPL
JPL CAD/document support inadequate in quality or timeliness	Quality impact, difficulty in achieving the key risk mitigation strategy of "all work is documented and checked".	Keep JPL informed of needs and schedule. Hold draft material until JPL "ready for it" and (for an interim period) use draft material in lieu of the formal material.

6. Work Breakdown Structure (WBS)

The CWO uses the standard ISDS WBS, modified to reflect the SOW.

CWO 5
ISDS Work Order Authorization

Name: Gerhard Stiebel	Company: CSC
	Revision: --

Note: CSC charge numbers are of the form 6513005www00 and www is zero filled (e.g., 100).

Work Breakdown Structure Number (www)	Description of Work
151	Document and transfer of voice compression equip in CCT and at DSCCs 40 and 40
152	Document and transfer of the CCT to TOPEX POCC COMM link
153	Document and transfer of CCT to CTA 21 Comm link
154	Complete interconnect diagram and all assy. drawings for the new digital matrix switch in CCT.
155	Document and transfer the new NIMs and Vmail in their final configuration.
461	Add baseband channel equipment to SPC 10 to DSSs 16/17 fiber link.
463	Integrate into existing configuration
156	Upgrade documentation and prepare complete mod kit including cables and transfer.
157	Prepare and provide complete mod kit to implement a highly reliable, precision clock source in the CCT.
471	Specify and procure equipment spares and cabling.

7. Earned Value Method

CWO 5 is strictly a Level of Effort task. Therefore, earned value (thus fee) will be claimed based on the expenditure of hours.

8. CWO Organization and Staffing

8.1 CWO Staff Names, Qualifications, & Availability

Since this CWO is an extension of the effort under Telos CWO 33 ,Gerhard Stiebel (identified by JPL as key to effort) has been transferred to the ISDS Team and is available full time for the task duration.

8.2 CWO Organization

CWO task manager is Chad Nikoletich, who reports to the ISDS program manager, Kent Thomson.

8.2.1 CWO in the JPL Organization

This CWO supports B. Hammer of Data Transmission Engineering, a branch of Section 394, Network Engineering.

8.3 Staffing Profile

This is an LOE support task for one person for the specified period. It has a constant one (1) FTE staffing profile.

8.4 Estimation Approach

This is an LOE support task with no software component. Therefore, estimation is LOE for one person for the specified period.

9. CWO Schedule and Dependencies

9.1 Schedule

This is an LOE support task therefore, there are no scheduled milestones.

9.2 Dependencies

Dependencies are those items outside the control of the CWO manager. We identify them here so we can plan for and manage them. Critical dependencies, if any, are included in the Risk Management Plan. The dependencies on this CWO are:

- Mission constraints: None
- JPL facilities: None
- JPL support: CAD support.
- User availability: None
- Site personnel: None
- GFE/GFI: Availability of hardware, tools, purchased software consistent with individual activities.

10. GFE/GFI Items

None.

11. Close-out Plan

This section will be provided 30 days prior to CWO end.

12. Deviations, Waivers, & Exceptions

This CWO has no deviations to established standards and procedures.